incorporated by reference. Chromic tripicolinate and biotin are commercially available from health food stores, drug stores and other commercial sources. In order to reduce the requirement for insulin and/or diabetic drugs and to reduce several important risk factors associated with Type II diabetes, it is anticipated that the dosage range of chromium administered to a patient in the form of chromic tripicolinate will be between about 50 and 1,000 μg/day. In a preferred embodiment, this amount is between about 500 and 1,000 μg/day. With regard to the biotin component of the combination therapy, the preferred daily dosage is between about 25 μg and 200 mg. More preferably, the daily dosage of biotin is between about 1 mg and 100 mg.

For oral administration, the chromic picolinates and biotin may be provided as a tablet, aqueous or oil suspension, dispersible powder or granule, emulsion, hard or soft capsule, syrup or elixir. Compositions intended for oral use may be prepared according to any method known in the art for the manufacture of pharmaceutically acceptable compositions and such compositions may contain one or more of the following agents: sweeteners, flavoring agents, coloring agents and preservatives. The sweetening and flavoring agents will increase the palatability of the preparation. Tablets containing chromic tripicolinate in admixture with non-toxic pharmaceutically acceptable excipients suitable for tablet manufacture are acceptable. Pharmaceutically acceptable means that the agent should be acceptable in the sense of being compatible with the other ingredients of the formulation (as well as non-injurious to the patient). Such excipients include inert diluents such as calcium carbonate, sodium carbonate, lactose, calcium phosphate or sodium phosphate; granulating and disintegrating agents, such as corn starch or alginic acid; binding agents such as starch, gelatin or acacia; and lubricating agents such as magnesium stearate, stearic acid or talc. Tablets may be uncoated or may be coated by known techniques to delay disintegration and absorption in the gastrointestinal tract and thereby provide a sustained action over a longer period of time. For example, a time delay material such as glyceryl monostearate or glyceryl distearate alone or with a wax may be employed.

Formulations for oral use may also be presented as hard gelatin capsules wherein the active ingredient is mixed with an inert solid diluent, for example calcium carbonate, calcium phosphate or kaolin, or as soft gelatin capsules wherein the active ingredient is mixed with water or an oil medium, such as peanut oil, liquid paraffin or olive oil.

Aqueous suspensions may contain the chromic tripicolinate complex of the invention in admixture with excipients suitable for the manufacture of aqueous suspensions. Such excipients include suspending agents, dispersing or wetting agents, one or more preservatives, one or more coloring agents, one or more flavoring agents and one or more sweetening agents such as sucrose or saccharin.

Oil suspensions may be formulated by suspending the active ingredient in a vegetable oil, such as arachis oil, olive oil, sesame oil or coconut oil, or in a mineral oil such as liquid paraffin. The oil suspension may contain a thickening agent, such as beeswax, hard paraffin or cetyl alcohol. Sweetening agents, such as those set forth above, and flavoring agents may be added to provide a palatable oral preparation. These compositions may be preserved by an added antioxidant such as ascorbic acid. Dispersible powders and granules of the invention suitable for preparation of an aqueous suspension by the addition of water provide the active ingredient in admixture with a dispersing or wetting agent, a suspending agent, and one or more preservatives. Additional excipients, for example sweetening, flavoring and coloring agents, may also be present.

Syrups and elixirs may be formulated with sweetening agents, such as glycerol, sorbitol or sucrose. Such formulations may also contain a demulcent, a preservative, a flavoring or a coloring agent.

The chromic tripicolinate preparations for parenteral administration may be in the form of a sterile injectable preparation, such as a sterile injectable aqueous or oleaginous suspension. This suspension may be formulated according to methods well known in the art using suitable dispersing or wetting agents and suspending agents. The sterile injectable preparation may also be a sterile injectable solution or suspension in a non-toxic parenterally-acceptable diluent or solvent, such as a solution in 1,3-butanediol. Suitable diluents include, for example, water, Ringer's solution and isotonic sodium chloride solution. In addition, sterile fixed oils may be employed conventionally as a solvent or suspending medium. For this purpose, any bland fixed oil may be employed including synthetic mono or diglycerides. In addition, fatty acids such as oleic acid may likewise be used in the preparation of injectable preparations.

The pharmaceutical compositions may also be in the form of oil-in-water emulsions. The oily phase may be a vegetable oil, such as olive oil or arachis oil, a mineral oil such as liquid paraffin, or a mixture thereof. Suitable emulsifying agents include naturally-occurring gums such as gum acacia and gum tragacanth, naturally occurring phosphatides, such as soybean lecithin, esters or partial esters derived from fatty acids and hexitol anhydrides, such as sorbitan mono-oleate, and condensation products of these partial esters with ethylene oxide, such as polyoxyethylene sorbitan mono-oleate. The emulsions may also contain sweetening and flavoring agents.

The amount of chromic tripicolinate/biotin that may be combined with the carrier material to produce a single dosage form will vary depending upon the host treated and the particular mode of administration.

The above description of the invention is set forth solely to assist in understanding the invention. It is to be understood that variations of the invention, including all equivalents now known or later developed, are to be considered as falling within the scope of the invention, which is limited only by the following claims.

What is claimed is:

1. A method for reducing hyperglycemia and stabilizing the level of serum glucose comprising administering to an individual in need thereof between about 50 and 1,000 micrograms per day of chromium as synthetic chromic tripicolinate in combination with between about 25 μg and 200 mg per day of biotin, wherein the amounts of chromic tripicolinate and biotin are selected together to provide a greater than additive effect.

2. The method of claim 1, comprising administering between about 500 and 1,000 micrograms per day of chromium as synthetic chromic tripicolinate.

3. The method of claim 1, comprising administering between about 1 mg and 100 mg biotin per day.

4. The method of claim 1, wherein said chromic tripicolinate is in a pharmaceutically acceptable carrier.

5. The method of claim 1, wherein said biotin is in a pharmaceutically acceptable carrier.

6. The method of claim 1, wherein said chromic tripicolinate is orally administered.

7. The method of claim 1, wherein said biotin is orally administered.

8. The method of claim 1, wherein said chromic tripicolinate is parenterally administered.

9. The method of claim 1, wherein said biotin is parenterally administered.

10. A pharmaceutical composition comprising chromium as synthetic chromic tripicolinate and biotin, wherein the ratio of chromium to biotin is between about 2:1 and 1:200 (w/w), wherein the amounts of chromic tripicolinate and biotin are selected together to provide a greater than additive effect.

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